

FIG. 1

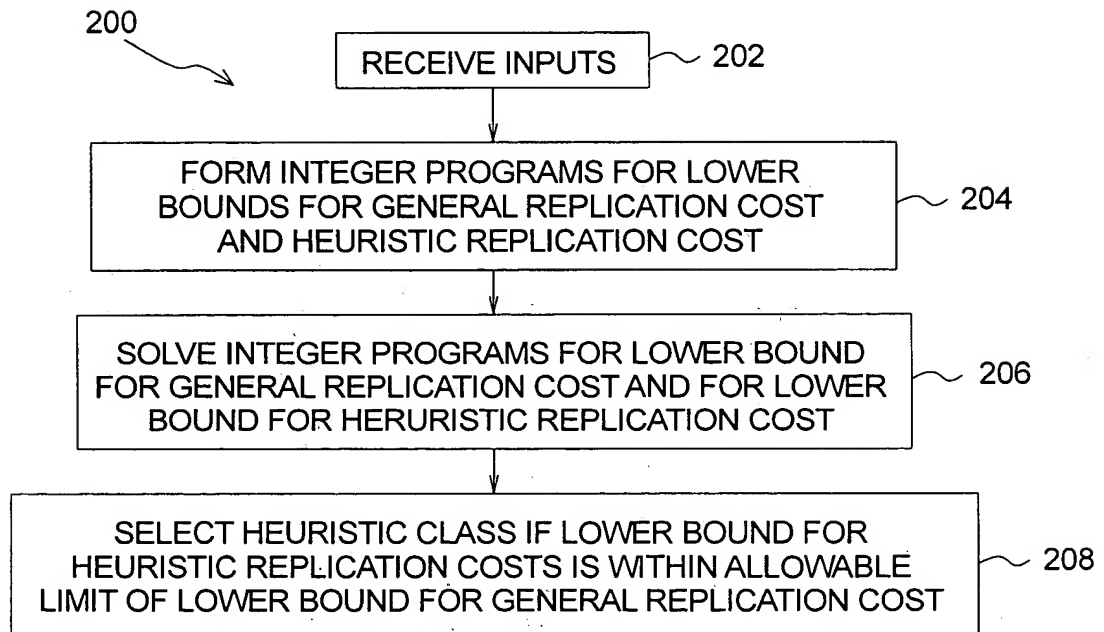


FIG. 2

Table 1		
Variable	Type	Description
$store_{nik}$	Binary	n th node stores k th data object during i th interval
$create_{nik}$	Binary	k th data object created on n th node during i th interval
$covered_{nik}$	Binary	n th node can access k th data object w/in latency threshold during i th interval
$open_n$	Binary	n th node is enabled; it can store replicas and run data placement heuristics

FIG. 3

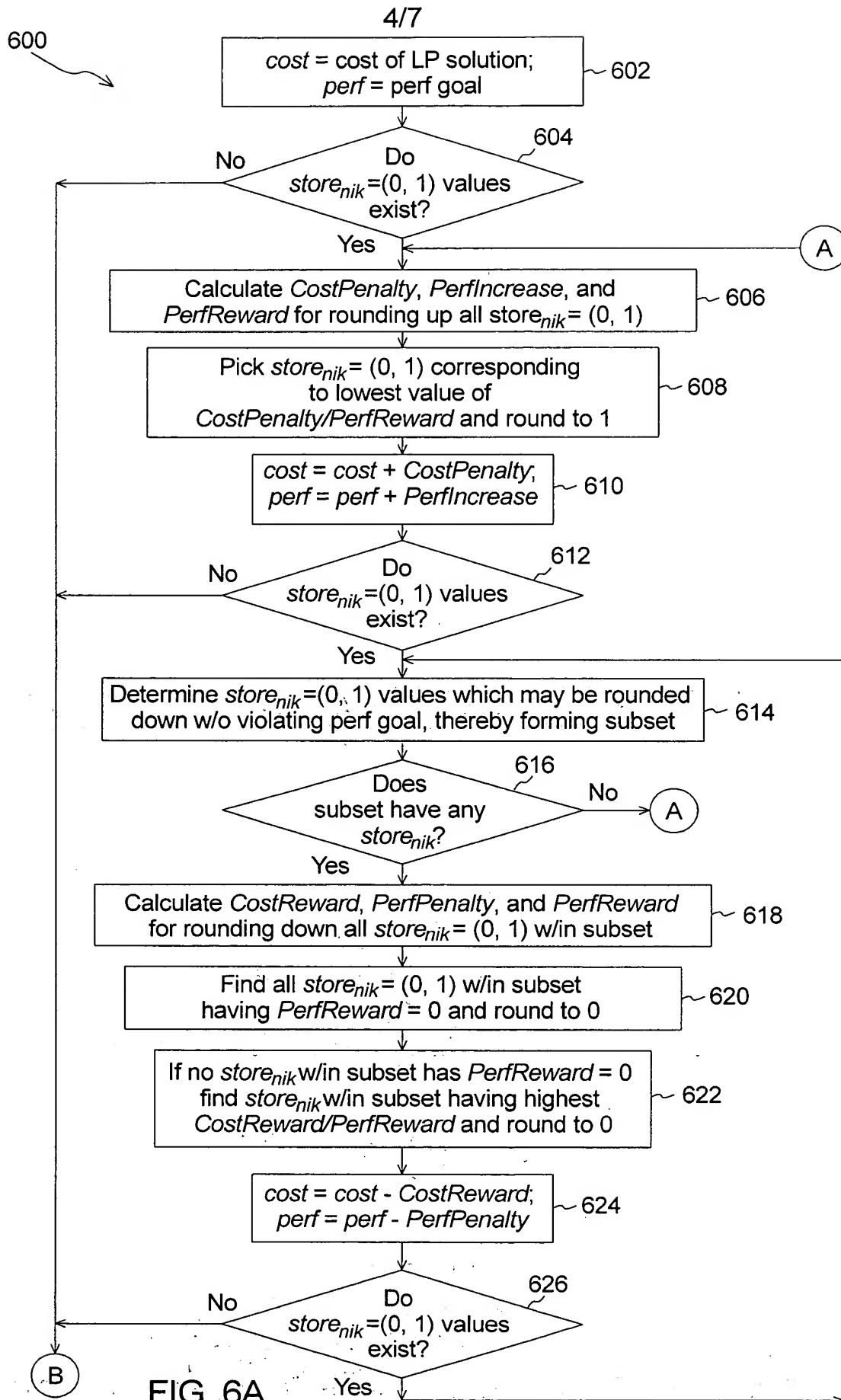
Table 2		
Variable	Type	Description
$read_{nik}$	Integer	Number of read requests from n th node for k th data object during i th interval
$write_{nik}$	Integer	Number of write requests from n th node for k th data object during i th interval
$latency_{nm}$	Real	Data access latency for accessing an object a th m th node from n th node
$dist_{nm}$	Binary	n th node can access m th node within latency threshold
$know_{nm}$	Binary	n th node uses information from m th node to make placement decision
$fetch_{nm}$	Binary	n th node can fetch data objects from m th node
$hist_{nik}$	Binary	n th node has a record in its activity history of k th data object being accessed on n th node during i th interval
T_{lat}	Real	Target latency threshold
T_{qos}	Real	Specified ratio of accesses served within latency threshold
α	Integer	Unit cost for storage
β	Integer	Unit cost for replica creation
γ	Integer	Unit cost penalty for an access exceeding latency threshold
δ	Integer	Unit cost for an update message
ζ	Integer	Unit cost for enabling and managing a node

FIG. 4

Table 3

Heuristic class	Heuristic properties					
	Storage constraint	Replica constraint	route	know	hist	Reactive constraint
Storage constrained heuristics	x		global	global	multi	
Replica constrained heuristics		x	global	global	multi	
Decentralized storage constrained heuristics w/ local routing	x		local	local	multi	
Local caching	x		local	local	single	x
Cooperative caching	x		global	global	single	x
Local caching w/ prefetching	x		local	local	single	
Cooperative caching w/ prefetching	x		global	global	single	

FIG. 5



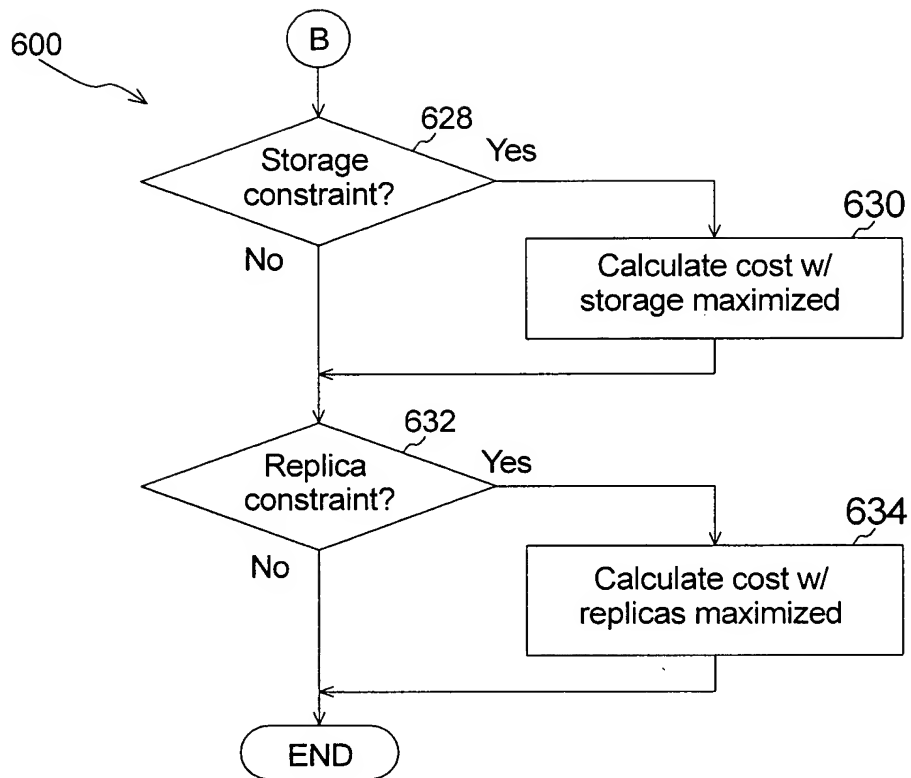


FIG. 6B

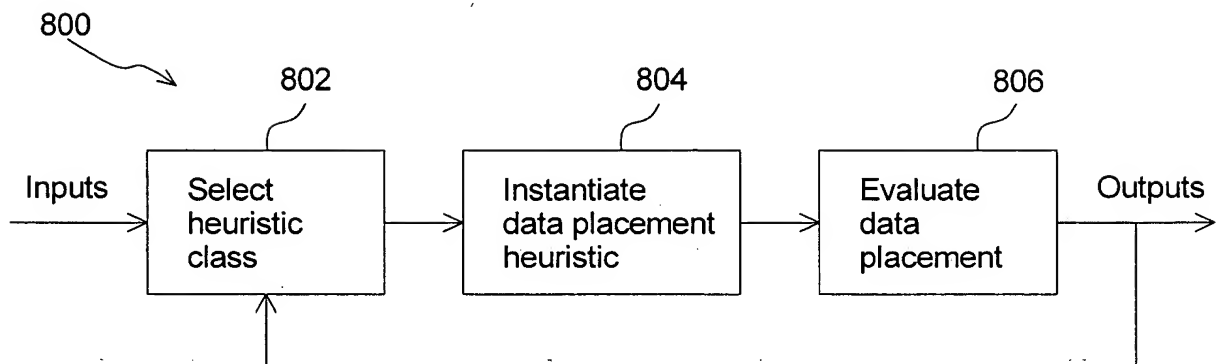


FIG. 8

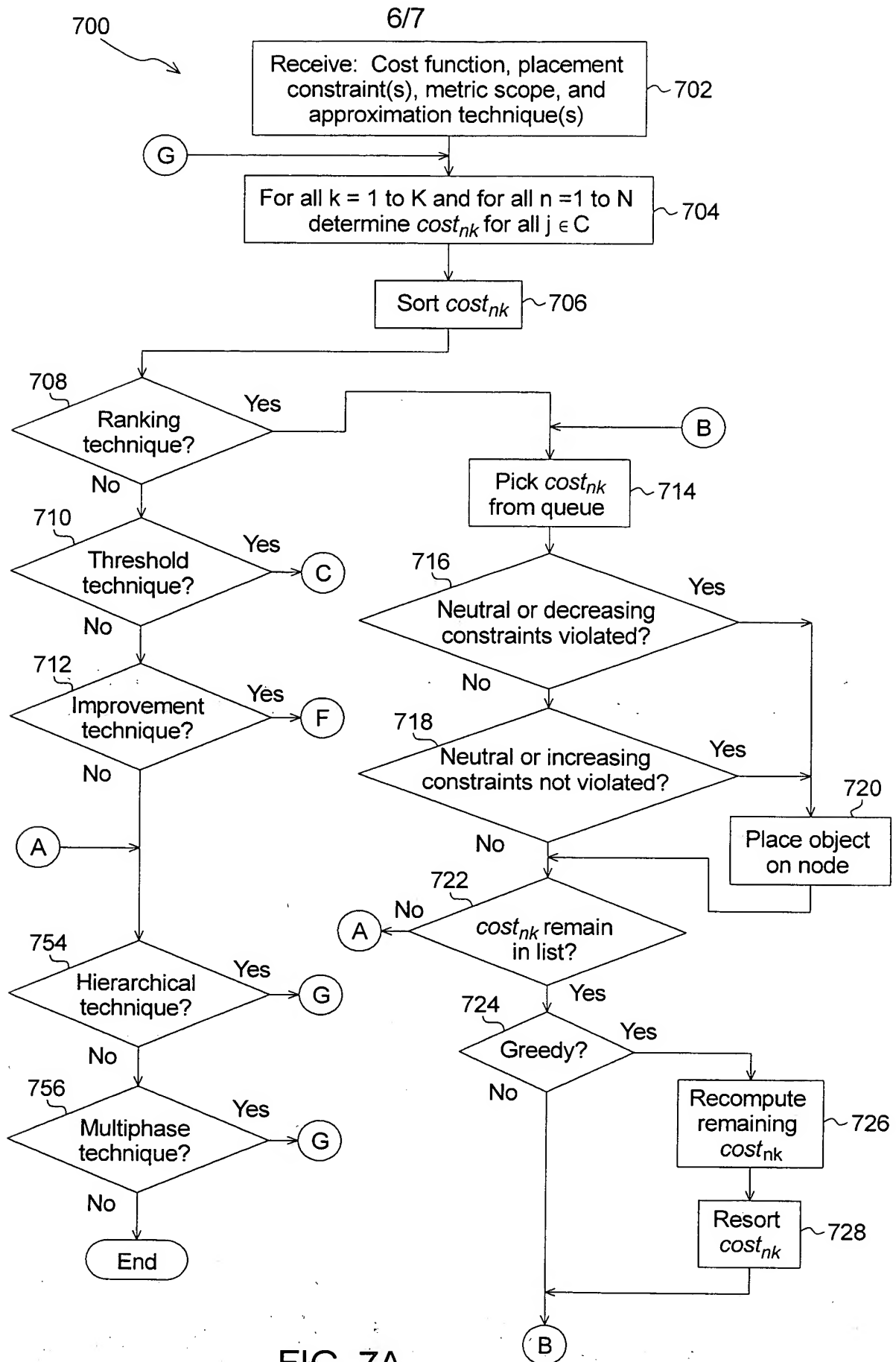


FIG. 7A

